

WHAT IS CLAIMED IS:

1. A composition of vitroceramic type comprising, in mol%:

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Ge	5-40
Ga	< 1
S + Se	40-85
Sb + As	4-40
MX	2-25
Ln	0-6
Adjuvant	0-30

in which:

- M represents at least one alkali metal chosen from Rb, Cs, Na, K and Zn,
- 10 - X represents at least one chlorine, bromine or iodine atom,
- Ln represents at least one rare earth metal, and
- Adjuvant represents at least one additive composed of at least one metal and/or at least one metal salt,

15 with the sum of the combination of the molar percentages of the components present in said composition being equal to 100.

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2. The composition as claimed in claim 1, characterized in that it comprises gallium in a content of less than or equal to 0.75 mol%, in particular of less than or equal to 0.5 mol%, especially of less than or equal to 0.25 mol%, indeed even of less than or equal to 0.1 mol%.

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3. The composition as claimed in claim 1 or 2, characterized in that it is devoid of gallium.

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4. The composition as claimed in any one of the preceding claims, characterized in that the

content of germanium varies from 10 to 35 mol%.

5. The composition as claimed in any one of the preceding claims, characterized in that the content of sulfur and/or selenium varies from 45 to 75 mol% and in particular from 50 to 75 mol%.
10. The composition as claimed in any one of the preceding claims, characterized in that the content of antimony and/or arsenic varies from 4 to 25 mol% and in particular from 8 to 20 mol%.
15. The composition as claimed in any one of the preceding claims, characterized in that the content of compound MX varies from 2 to 15 mol%.
20. The vitreous composition as claimed in any one of the preceding claims, characterized in that the content of rare earth metal varies from 0 to 3 mol%.
25. The vitreous composition as claimed in any one of the preceding claims, characterized in that the content of adjuvant varies from 0 to 10 mol%.
30. The vitreous composition as claimed in any one of the preceding claims, characterized in that Ln represents at least one rare earth metal chosen from Dy, Er, Nd, Pr, Yb, Tm, Ho and their mixtures.
35. The composition as claimed in any one of the preceding claims, characterized in that the adjuvant is chosen from Ca, Ba, In, Te, Pb, Cu, Ag, Cd, their salts, such as, for example, CuI and PbI<sub>2</sub>, and their derivatives, for example, Ag<sub>2</sub>Se and CdTe, and their mixtures.
12. The composition as claimed in any one of claims 1

to 11, characterized in that it is a quaternary mixture of germanium in a content varying from 15 to 30 mol%, of antimony in a content varying from 4 to 20 mol%, of selenium in a content varying from 50 to 70 mol% and of cesium halide, such as 5 CsCl, CsBr or CsI, in a content varying from 3 to 15 mol%.

13. The composition as claimed in any one of claims 1  
10 to 11, characterized in that it is a quaternary mixture of germanium in a content varying from 15 to 20 mol%, of antimony in a content varying from 10 to 15 mol%, of sulfur in a content varying from 45 to 65 mol% and of cesium halide, such as CsCl, 15 CsBr or CsI, in a content varying from 2 to 15 mol%.

14. The composition as claimed in any one of claims 1  
20 to 11, characterized in that it is a five-component mixture of germanium in a content extending from 10 to 25 mol%, of antimony in a content extending from 10 to 25 mol%, of selenium in a content extending from 55 to 65 mol%, of cesium halide, such as CsCl, CsBr or CsI, in a content extending from 2 to 5 mol% and of an 25 adjuvant chosen from PbI<sub>2</sub>, CuI, Ag<sub>2</sub>Se and CdTe in a content extending from 1 to 7 mol%.

15. The composition as claimed in any one of the 30 preceding claims, characterized in that it exhibits a transparency in the infrared, in particular in the wavelengths extending from 0.7 to 14  $\mu\text{m}$  and especially extending from 0.7 to 11  $\mu\text{m}$  or from 0.9 to 14  $\mu\text{m}$ .

35 16. The composition as claimed in any one of the preceding claims, characterized in that it comprises at least 0.1% of crystallized volume with crystals with a size of less than or equal to

1  $\mu$ m.

17. The composition as claimed in claim 16, characterized in that the crystals have a mean size of less than or equal to 500 nm, in particular of less than 400 nm, indeed even of less than or equal to 300 nm.

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18. The composition as claimed in claim 16 or 17, characterized in that the crystals have a mean size of greater than or equal to 1 nm, in particular of greater than or equal to 2 nm and especially of greater than or equal to 5 nm.

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15 19. The composition as claimed in any one of claims 16 to 18, characterized in that the crystals have a size varying from 10 to 300 nm and in particular from 50 to 300 nm.

20 20. A noncrystalline vitreous composition comprising, in mol%:

Ge	5-40
Ga	< 1
S + Se	40-85
Sb + As	4-40
MX	2-25
Ln	0-6
Adjuvant	0-30

in which:

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- M represents at least one alkali metal chosen from Rb, Cs, Na, K and Zn,
- X represents at least one fluorine, chlorine, bromine or iodine atom,
- Ln represents at least one rare earth metal, and
- Adjuvant represents at least one additive composed of at least one metal and/or at least

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one metal salt,  
with the sum of the combination of the molar percentages of the components present in said composition being equal to 100.

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21. The composition as claimed in claim 20, characterized in that its constituents are as defined in claims 2 to 14.

10 22. A process for the preparation of a composition of vitroceramic type as claimed in any one of claims 1 to 19, characterized in that it comprises the heat treatment of a vitreous composition as claimed in claim 20 or 21 at a temperature and for 15 a period of time sufficient to produce crystals with a size of less than 1  $\mu\text{m}$ , in particular of less than or equal to 500 nm, especially of less than or equal to 400 nm, indeed even of less than or equal to 300 nm.

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23. The use of a composition of vitroceramic type as defined in any one of claims 1 to 19 in an infrared system operating in a wavelength range extending from 0.7 to 14  $\mu\text{m}$  and in particular extending from 0.7 to 11  $\mu\text{m}$  or from 0.9 to 14  $\mu\text{m}$ , especially in thermal imagers operating from 3 to 25 5  $\mu\text{m}$  and/or from 8 to 12  $\mu\text{m}$ .